

M/V S. Zakariadze, San Juan, PR
Cement Cargo Options
21 November 1999

Some cement will have to be offloaded (est. 6000 tons) once oil, ballast and other equipment is removed in order to lighten the vessel enough to refloat it. What happens with this cargo and how it is handled will depend on several factors: 1) the condition and structural stability of the vessel at the time, 2) the weather and sea conditions at the time, 3) the on-scene support equipment that will facilitate the operation, and 4) the safety of the overall operation.

A Jack-up barge has been contracted and will be arriving from Trinidad in approximately one week. Once on-scene and in place, deck cranes placed on the barge will be able to begin the offloading of the cement. Possible options at this time include: 1) placing the cement directly over the side at or near the grounding position, 2) transferring the cement to a grain barge which will then deliver the cement to the intended recipient in San Juan, 3) transferring the cement to a small barge which will then transport the cement farther off shore to dump. The possibility of mixing the cement powder with water prior to dumping is also being investigated.

1. The preferred option is to remove the necessary amount of cargo and deliver it to the customer on shore. To do this will depend on being able to obtain a grain barge that can be brought alongside, loaded and then extracted. It will also require favorable wind and sea conditions for a safe, effective operation, and the M/V S. Zakariadze must be stable and structurally sound enough so as not to be an unacceptable safety hazard to the crews and responders.

2. If these safety and operational constraints cannot be met. The cement may have to be dumped directly over the side of the vessel into the water. Disposal immediately adjacent to the vessel would entail dumping the product directly from the holds into waters immediately adjacent to the vessel. The product runs the risk of being carried into the existing navigation channel. This channel is located just beyond the stern of the vessel. The US Army Corps of Engineers has expressed major concerns with product entering the channel and possibly creating obstructions to navigation or future dredging operations.

NOAA HazMat has done a preliminary environmental evaluation for this action. (report follows):

Per your request, Dr. Jim Farr made the following comments with regard to a discharge of Cement

The discharge of a large quantity of bulk cement into the water over the side of the vessel will create an increased pH plume in the immediate area of the spillage. The high pH plume should not be extensive as the dilution and buffering capacity of ocean water should restrict the effects to the immediate area near the ship. High pH can be lethal to organisms in the water column and on the bottom. The effect may be

somewhat more extensive on the bottom as the solid spreads out along the bottom.

There will also be a particulate plume created that in the intertidal zone may be fairly extensive. Depending on the rate of spillage much of the solid cement material will form a cap on the bottom, that would smother organisms on the bottom. Because of the turbulence in the intertidal, much particulate may be dispersed in the water. It should be noted that increased particulate in the water may cause increased risk of sinking of heavy fuel oil, if the fuel is released. This is especially significant in the intertidal where you already have a high particulate load.
(end report)

To minimize environmental impact, the input rate of the cement powder into the water should be controlled to allow for dilution and dispersion rather than to allow large amounts of cement to concentrate in one area on the bottom.

Other options that have been proposed include:

A) Offloading the cement to a hopper barge, transporting the material farther offshore, and dumping it into deeper water. Although there may be some benefits to dumping the cement in deeper water rather than shallow nearshore waters, this option is not recommended. Puerto Rico DNER, EPA and USFWS have expressed concerns regarding this option. It should be avoided unless an emergency situation dictates it is needed for a more expedient operation. If no emergency exists, then the offloaded material should be offloaded on shore rather than dumped at sea.

B) Disposal onto the existing breakwater. A breakwater was constructed several years ago to protect El Morro castle by the US Army Corps of Engineers. This option would place the product on top of the breakwater. Again, this option runs the risk of product entering the navigation channel.

C) Disposal into the channel behind the breakwater. This option would require pumping product into a channel behind the breakwater. This channel is about 20' deep. This option would avoid product from entering the navigation channel. The breakwater and channel are not part of the San Juan Historic Site. This area has already been impacted by the construction of the breakwater.

Salvors have indicated that the feasibility of mixing the cement powder prior to discharging it to the sea is also being evaluated. If this is possible, the cement would pose less of a threat from a pH standpoint to water column resources but would still smother benthic resources. If no sensitive benthic resources exist in the area, the cement should provide no environmental concern.

Any disposal in the water would require an emergency dumping permit from EPA under section 102 of the Marine Protection Research and Sanctuary Act and permits from the US Army Corps of Engineers under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act.

It is recommended that, if possible, an underwater survey of the bottom be conducted prior to dumping cement to map any present coral or other benthic resources present that may be impacted. Once the bottom is inspected and characterized it may be possible to recommend a preferred area for disposal. NOAA has recently conducted mapping of benthic habitats around Puerto Rico and updated ESI maps for the area. If this information is available, it may assist in planning for the protection of sensitive resources during the response.